



# Introduction to Project Management

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EFTS/EODI Training Programme

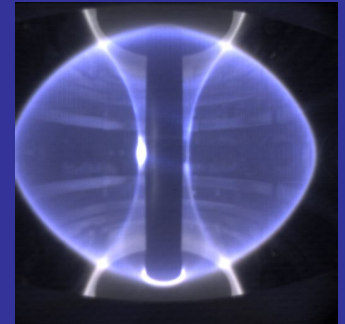
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# Course Objectives

- To provide participants with:
  - An awareness of the importance of applying good practice Project Management in projects of any size.
  - An understanding of essential elements, including the Leadership Role of the Project Manager, Project Planning, Risk Management and Stakeholder Engagement.
  - An understanding of the principle elements of design control to be applied within projects at Culham.

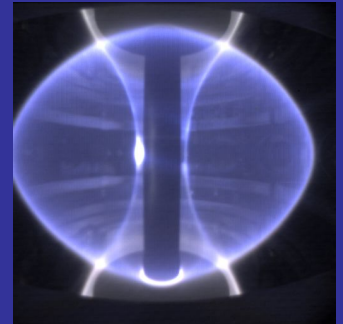
# Culham Challenges

- “What are the particular technical challenges facing projects at Culham?”
  - Research environment
    - requirements may be hard to define and may change
    - producing one or a few items rather than production line
  - Uncertainties of leading edge R&D ⇒
    - solutions may have to be developed, including possibly new technologies
    - ‘first of a kind’ so planning and estimating is difficult
  - Need to balance the desire to get maximum performance versus achieving acceptable reliability/availability



# Culham Challenges

- “What are the particular management challenges facing projects at Culham?”
  - Requirements hard to define and may evolve
  - Risk Management (all aspects) crucial but difficult
  - Cross functional team composition
  - Competing pressures on resources, e.g. design office
  - Working with scientific organisations not used to project and QA disciplines  $\Rightarrow$  planning may be poor
  - Collaborative agreements rather than contracts
  - Political - EC funding requirements
  - Growing funding pressures due to ITER



# What is a Project?

“Unique process consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including constraints of time, cost, quality and resources”

- A Project is a planned set of activities
- A Project has a scope
- A Project has time, cost, quality and resource constraints

# What is Project Management?

- The art of organising, leading, reporting and completing a project through people



# What is Project Management?

- A project is a planned undertaking
- A project manager is a person who causes things to happen
- Therefore, project management is causing a planned undertaking to happen.

# Exercise 1

- Write down three attributes of a good Project Manager

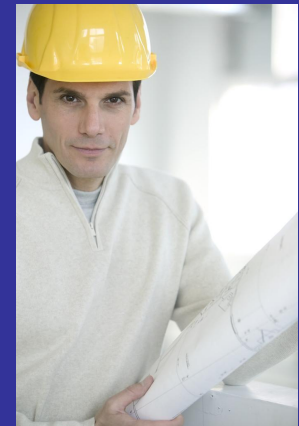




# Project Manager Role

## ■ A Good Project Manager

- Takes ownership of the whole project
- Is proactive not reactive
- Adequately plans the project
- Is Authoritative (**NOT** Authoritarian)
- Is Decisive
- Is a Good Communicator
- Manages by data and facts not uniformed optimism
- Leads by example
- Has sound Judgement
- Is a Motivator
- Is Diplomatic
- Can Delegate



# Stakeholder Engagement



# Stakeholder

“A person or group of people who have a vested interest in the success of an organization and the environment in which the organization operates”



# Exercise 2

- Write down three typical project stakeholders



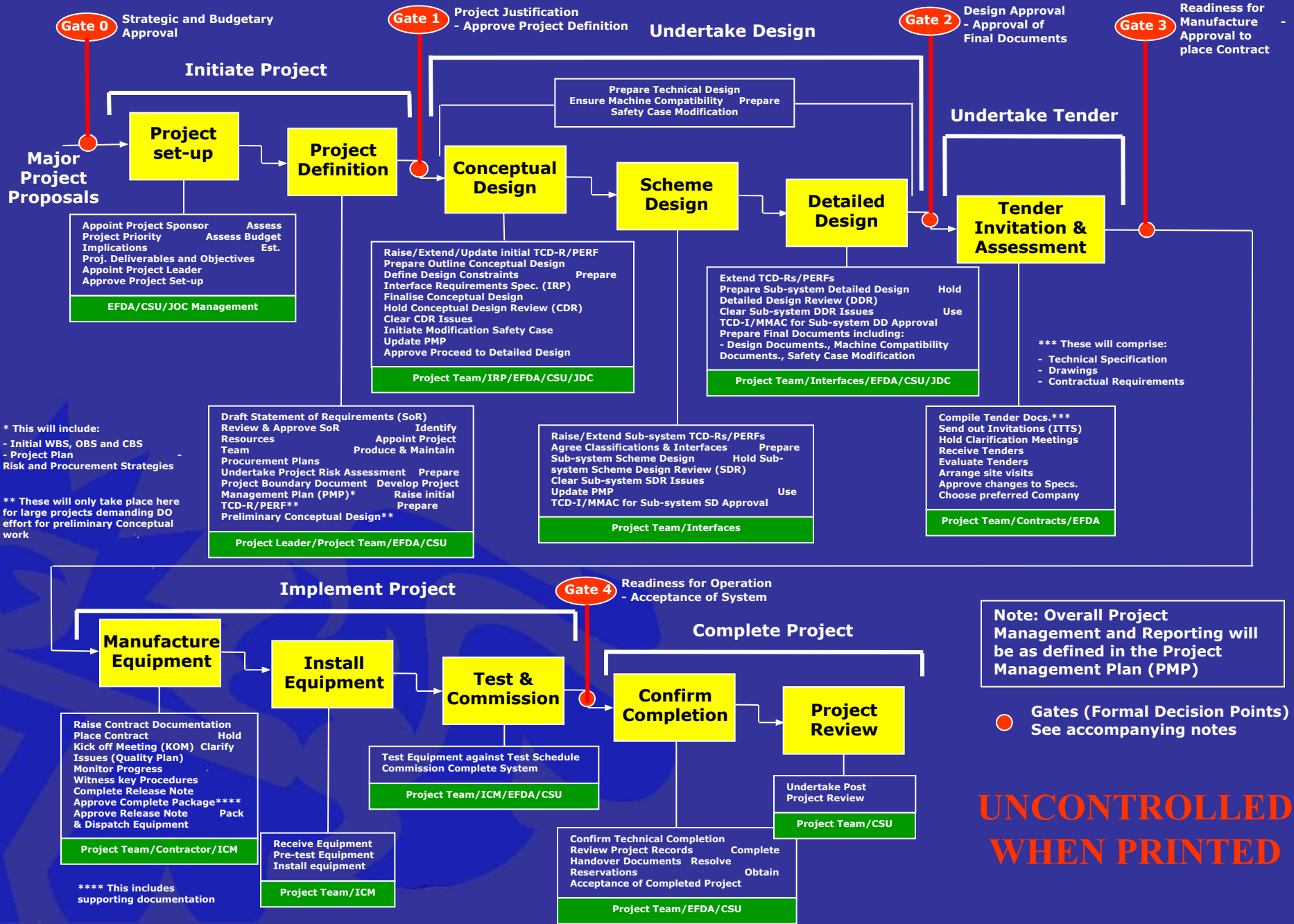
# Exercise 2 - Typical Stakeholders

- Sponsor
- Funding Body
- Customer
- Suppliers
- End User
- HSE/Environmental Agency
- Maintenance Team
- Neighbours/Community/Shareholders
- Fusion Community
- Interfaces

# Stakeholder Engagement process

- Identify Stakeholders
- Assess needs
- Define actions
- Establish communication channels
- Gather feedback
- Monitor and review

# The Project Process



# Key Points in Project Set-up and Definition

- Create Project Management Plan (PMP)
- Be clear of scope and objectives
- Establish clear statement of what is to be done (WBS)
- Establish Risks to be Managed
- Establish Costs and Durations
- Establish Resources Required



# Project management Plan - PMP

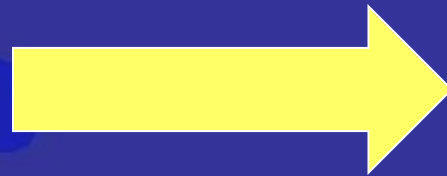
- Master Document for Project
- Defines the following:-
  - ⇒ Project Objectives, Scope, Deliverables
  - ⇒ Stakeholders (Internal & External)
  - ⇒ Work to be done (WBS)
  - ⇒ Project Organisation and Resources (OBS)
  - ⇒ Project Costings (CBS)
  - ⇒ Project Schedule
  - ⇒ Procurement/Contract Strategy
  - ⇒ Risk Management
  - ⇒ Quality management
  - ⇒ Change Management

# Project Planning



# Project Planning

- Adequate planning leads to the correct completion of work



# Planning

- Inadequate planning leads to frustration towards the end of the project & poor project performance



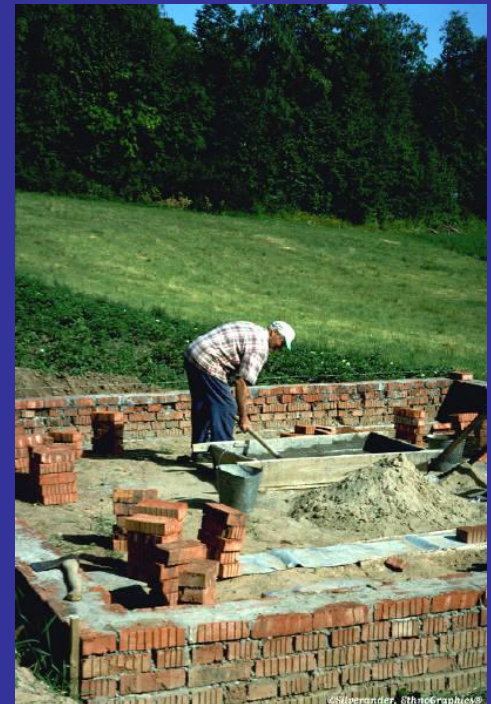
Project Start



Project End

# Work Breakdown Structure (WBS)

- The Work Breakdown Structure is the foundation for effective project planning, costing and management.
- It is the most important aspect in setting-up a Project
- It is the foundation on which everything else builds



# Work Breakdown Structure - Definition

“A Work Breakdown Structure (WBS) is a hierarchical (from general to specific) tree structure of deliverables and tasks that need to be performed to complete a project.”





# Example WBS - Top Level ILW Project



# Example WBS - Top Level TSCL Project





# Project Planning – WBS (1)

- Lowest Level of WBS is the Work Package (WP)
- WP can be clearly defined allowing package to be costed, scheduled and resourced
- WP contains a list of Tasks to be Performed that form the basis for the Schedule
- WP allows assignment of responsibilities (Work Package Manager, WPM)

# Project Planning – WBS (2)

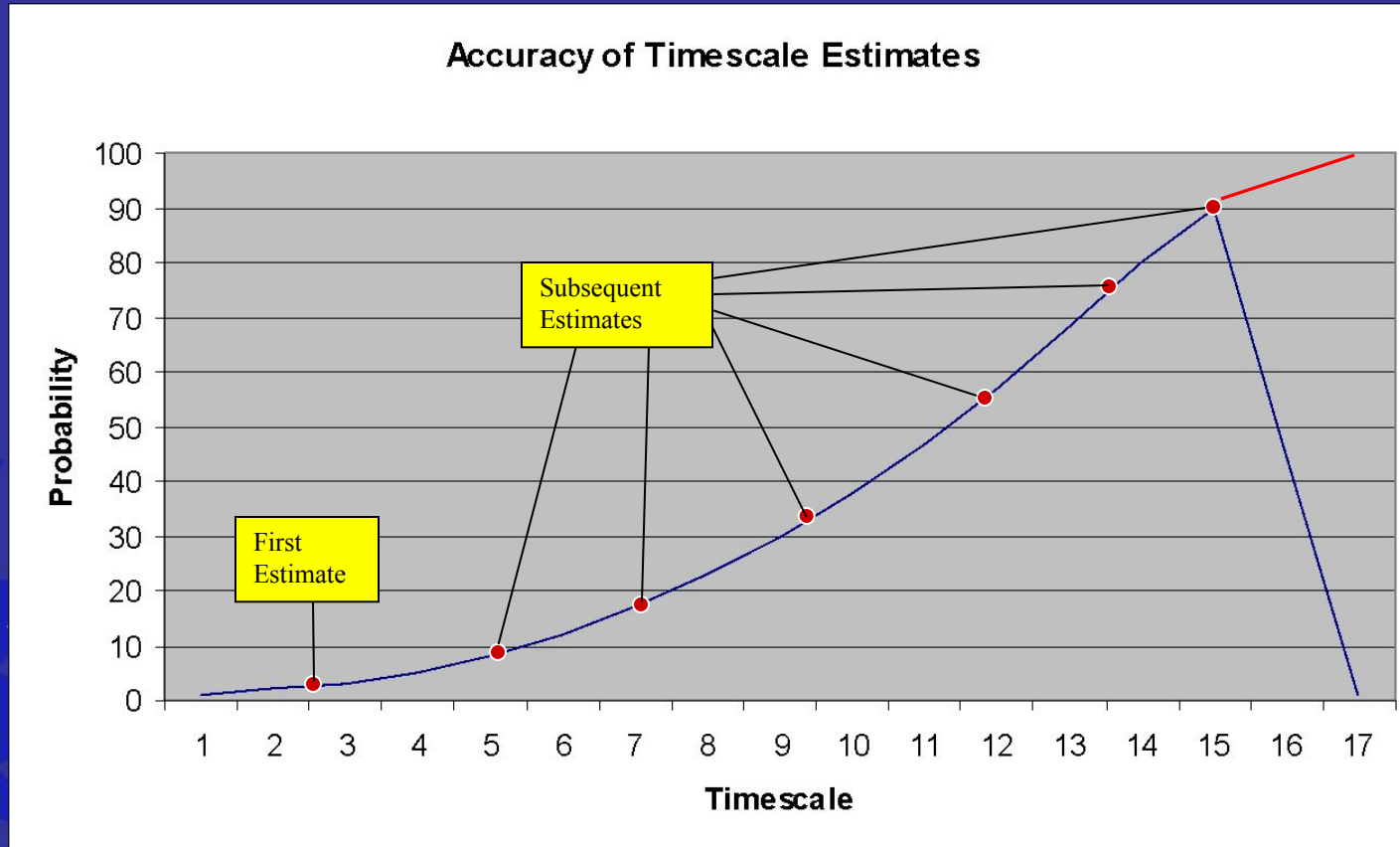
- WBS allows hierarchical build-up of costs and schedule
- Cost and Schedule can be reported at any level of the WBS
- WBS facilitates strong management during project execution (Cost and Schedule control)
- WBS can be used for many other things - Document Management, Risk Management etc.

# Project Planning

## ■ A word about Scheduling

- Schedules (task durations) can have a wide variation
- There is no unique answer. Rather, there is a statistical variation depending on assumptions
- Need to understand the basis of scheduling (Most challenging; Most likely; Absolute certainty - bet your life on it!)
- Most people are very optimistic/naive

# Common schedule development



# Example WBS for the ITER-Like Wall & TSCL Projects



ILW WBS

**MJ Kear**



TSCL WBS

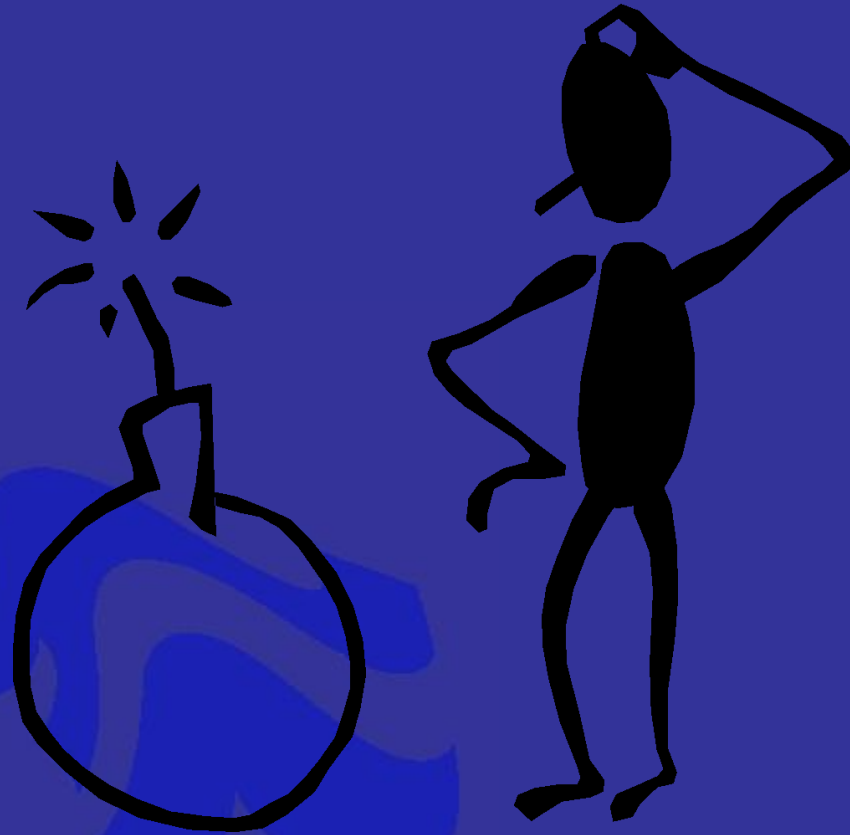


ILRH Schedule

# Project Planning – Key Points

- Recognise that adequate project planning is essential
- Produce a sound WBS
- Use the framework provided by the Project Management Plan (PMP) template
- Involve the right people
- Allow enough time
- Be systematic

# Project Risk Management



# Project Risk – Definition (1)

“Project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on a project objective”





# Project Risk – Definition (2)

“A combination of the probability of a defined threat or opportunity (Likelihood) and the magnitude of the consequences of the occurrence (Impact) defines a Risk Index”



# Risk Impact

Threat → Scope → Poor Quality Product

Threat → Schedule → Late Delivery

Threat → Cost → Overspend

- In addition there are health, safety and environmental threats that must be managed (CDM Regulations)

# Risk Management Process

- Identify Risks
- Assess likelihood and impact
- Rank risks and prioritise
- Define risk management approach & actions
- Implement actions
- Monitor & review

# Example Risk Management for the ITER-Like Wall Project

MJ Kear



Microsoft  
PowerPoint Presentations

# Risk Management – Key Points

- Make the management of risk integral to the way the project is managed
- Ensure that cost and time contingencies are consistent with identified risks
- Focus on the “significant few” – don’t try to manage too many risks
- Be vigilant and proactive

# Project Monitoring and Control



# Exercise 3

- Write down three typical project control/monitoring activities

# Project Monitoring

## ■ Typical Monitoring Activities

- regular reviews of progress against schedule using WBS as basis (Plan against Baseline)
- regular review of actual costs (O/P from SAP) against budgeted costs and Earned Value at WBS level
- regular review of resource loading
- regular progress meetings with project team
- regular meetings with contractors
- production of periodic progress reports
- risk reviews
- inspections/ audits



# Project Control

## ■ Typical Control Activities

- assign responsibilities at Work Package level
- staged authorisation of work to be done
- staged release of budgets (staged release of WBS(e) numbers)
- ensure PM has a 'Management Reserve' under his control
- seek corrective action reports when WPs go 'off track' (overrunning or overspending)
- release Management Reserve carefully

# Project Monitoring and Control Summary

- Monitor against the plan – status regularly
- Take a factual approach to decisions
- Identify management action early
- Check that defined controls are being applied – correct if necessary
- Apply change control



# Introduction to Design Management

# Design Management

- Design takes place as part of a project
- Design Management is part of Project Management
- Design Management considerations must be included in the PMP

# Exercise 4

- Write down three Design Management Activities



# Exercise 4 - Design Management Activities

- Sub-divide Design Stages (CD, SD & DD)
- Sub-divide Tasks (WBS)
- Define Constraints and Interfaces (WPD Summary Sheet)
- Formally Initiate the Design (TCD-R/PERF)
- Ensure Design conforms to H&SE and CDM Requirements
- Hold Design Reviews (Peer review)
- Formally Approve Design (TCD-I/MMAC)

# Design Stages

- Conceptual Design
- Scheme Design
- Detailed Design



# Conceptual Design Phase

- TCD-R
- Decide Local or TCS route
- Develop Conceptual Design
- Define Constraints & Interfaces
- Carry out Conceptual Design Review
- Initiate Safety Case Modification if required
- Obtain Approval to Proceed to next stage



# Scheme and Detailed Design

- Basic considerations and process similar to concept
- Need to ensure that safety & environmental issues receive proper consideration as design develops (CDM Regulations)

# Exercise 5

- List who should be invited to a design review
- Write down three issues that should be considered at a design review



# Exercise 5 - Design Reviews, Attendance

- Project Leader or nominee (Chairman)
- RO (Work Package Manager)
- Customer
- End User
- Safety and Quality Reps
- All other Relevant Interfaces/Stakeholders
- Other Experts in the area being reviewed

# Exercise 5 - Design Reviews, Issues to Consider

- Assumptions and Constraints
- Technical Solutions - Does it meet the Spec?
- Safety, Environment and CDM issues
- Can it be Manufactured/Maintained?
- Actions from previous DRs
- Issues to be resolved (including Timescales)

# Safety & Environment

- Need to ensure that safety & environmental issues receive proper consideration as design develops
  - Involve the right people from the start
  - Systematically identify issues – Hazards/Risks, Environmental Aspects & Impacts
  - Carry out rigorous reviews at each design stage
  - Control Design Changes
- MUST take note of CDM Regulations

# CDM Regulations

- CDM - Construction (Design & Management)
- Regulations recently updated
- Now must have someone in EACH Project Responsible for CDM
- Currently information is on the Conceptual, Scheme & Detailed Design steps on the Process Maps
- More information will be developed over the coming months

# Design Change control

- Needs to be a formal and defined procedure
- New procedure in place CD/P/J008 for JET Facilities



# Confirm Completion

- Ensure design records are complete and accurate
- Ensure any outstanding actions or issues are addressed
- Ensure Maintenance Records are produced
- Ensure User Manuals are produced
- Hold a formal Post Project review